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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,954	01/10/2002	Warren S. Letzsch	696-254	6370

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Alan B. Clement, Esq.  
HEDMAN & COSTIGAN, P.C.  
1185 Avenue of the Americas  
New York, NY 10036

EXAMINER
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LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 11/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/043,954	LETZSCH, WARREN S.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 11-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-22 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/12/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's amendment filed on September 12, 2003 has been received and carefully considered. The changes made to the Specification and Drawings are acceptable. Claims 1-22 remain active. Claims 11-22 are withdrawn from consideration. Claims 1-10 stand rejected.

### *Claim Objections*

2. Claim 6 is objected to because the range, "about 175° to about 150°" should be changed to, -- about 150° to about 175° --. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-6 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Xu et al. (EP 1 046 696).

Regarding claims 1, 2 and 8, Xu et al. (FIG. 1, 2; sections [0017], [0034]) disclose an apparatus for the catalytic cracking of hydrocarbonaceous feedstocks comprising:

- a first riser reactor section having a radius  $x$  (i.e., first reaction zone **b**, **5**), a means for feeding a hydrocarbon feedstock (i.e., feedstock conduit **4**) and a means for feeding cracking catalyst (i.e., standpipe **16**) located in a lower portion thereof;
- a second riser reactor section having a radius  $y$  (i.e., second reaction zone **c**, **7**) wherein the ratio of  $y:x$  ranges from about 1.1:1 to 5.0:1, or about 1.25:1 to 2.5:1 (i.e., "The

diameter ratio of the [second reaction zone] to the [first reaction zone] is generally from about 1.5:1 to about 5:1"; see section [0025], lines 24-25) operatively connected to said first riser reactor section (**b, 5**) by a first diameter transition section (i.e., conjunct section comprising angle " $\alpha$ "; section [0022], lines 9-11);

- a riser product conduit (i.e., outlet zone **d, 8**) having an inlet operatively connected to said second riser reactor section (**c, 7**) by a second diameter transition section (i.e., conjunct section comprising angle " $\beta$ "; section [0022], lines 11-12) and having an outlet operatively connected to a separator means (i.e., set of cyclones **10**); and
- a disengager vessel (**9**) having an upper dilute phase and a lower dense phase, said upper dilute phase suitable for receiving cracked product gases and for supporting said separator means (**10**); and said lower dense phase suitable for receiving catalyst from said separator means (**10**); said disengager vessel (**9**) further comprising an outlet (i.e., conduit **11**) for removing separated cracked gases from said separator means (**10**).

In view of the newly added limitations, the recitation that the first riser reactor section **b,5** comprises "a first riser *cracking* section" and the second riser reactor section **c,7** comprises "a second riser *cracking* section" does not patentably distinguish over the apparatus of Xu et al., since the specific reaction to be conducted within the respective sections of the riser (i.e., cracking versus isomerization, etc.) is merely a recitation of intended use, which provides no further structural limitation to the apparatus. Thus, the apparatus of Xu et al. meets the claims.

Regarding claims 3-4, Xu et al. (FIG. 1, 2; section [0022]; lines 9-11) disclose said first diameter transition section operatively connects said first reactor section (**b, 5**) to said second reactor section (**c, 7**) at an isotrapezia vertex angle  $\alpha$  generally about 30° to 80°. Comparing

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FIG. 1 of Xu et al. to Applicant's Figure, the equivalent to angle **22** lies within the range of about 190° to 240°, and meets the recited angle measurements, lying within the range of about 185° to 210°, or about 188° to 200°.

$$\begin{aligned}\text{EQUIVALENT ANGLE} &\cong 90^\circ + (180 - \alpha) \\ \text{upper range} &\cong 90^\circ + (180 - 30^\circ) \cong 240^\circ \\ \text{lower range} &\cong 90^\circ + (180 - 80^\circ) \cong 190^\circ\end{aligned}$$

Regarding claim 5, Xu et al. disclose said riser product conduit (**d**, **8**) has a radius of approximately  $x$ , or a radius approximately equal to the diameter of the first riser reactor section (**b**, **5**); ("The diameter ratio of the outlet zone to the first reaction zone is generally about 0.8:1 to about 1.5:1"; section [0026]; FIG. 1, 2).

Regarding claim 6, Xu et al. (FIG. 1, 2; section [0022]; lines 11-12) disclose said second diameter transition section operatively connects said riser product conduit (**d**, **8**) to said second reactor section (**c**, **7**) at an isotrapezia base angle  $\beta$  generally about 45° to about 85°. Comparing FIG. 1 of Xu et al. to Applicant's Figure, the equivalent to angle **27** lies within the range of about 135° to about 175°, and meets the recited an angle measurement of about 150° to about 175°.

$$\begin{aligned}\text{EQUIVALENT ANGLE} &\cong 90^\circ + \beta \\ \text{lower range} &\cong 90^\circ + 45^\circ \cong 135^\circ \\ \text{upper range} &\cong 90^\circ + 85^\circ \cong 175^\circ\end{aligned}$$

Regarding claim 9, Xu et al. disclose said lower dense phase of disengager vessel (**9**) is equipped with means for stripping hydrocarbons from the catalyst received from the separator means (i.e., catalyst stripper **12**; stripping steam via conduit **13**; FIG. 2; section [0034]).

Regarding claim 10, Xu et al. (FIG. 2; section [0034]) disclose a regenerator vessel (i.e., regenerator **15**) comprising means for receiving spent catalyst (i.e., spent catalyst standpipe **14**)

from said lower dense phase of said disengager vessel (9); means for regenerating said catalyst (i.e., "contacted with air via conduit 17 with the result that catalyst regeneration takes place to burn off coke."); and means for recycling regenerated catalyst (i.e., via regenerated catalyst standpipe 16) to said first reactor section (b, 5).

Instant claims 1-6, 9 and 10 structurally read on the apparatus of Xu et al.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al. (EP 1 046 696) in view of Goelzer et al. (U.S. 5,087,349).

Xu et al. (FIG. 2) disclose a quench injection means (conduit 6) for supplying quenching mediums to the effluent flowing into the second reaction zone (c,7) via the first diameter transition zone, to control the reaction temperature of the zone (sections [0025], [0034]). However, Xu et al. are silent as to whether riser product conduit (d,8) may comprise a quench injection means. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide a quench injection means to the riser product conduit in the apparatus of Xu et al., on the basis of suitability for the intended use (i.e., for obtaining certain reaction temperature within the riser product conduit) and absent showing any unexpected results thereof, since it is known in the art to distribute quenching means along the length of a catalytic cracking riser reactor to achieve a desired riser reactor temperature profile for maintaining desired product yields, as taught by Goelzer et al. (column 8, lines 27-40; column 11, lines 4-40; column 12, lines 1-43). In any event, shifting location of parts is

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obvious, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233.

### ***Response to Arguments***

5. Applicant's arguments filed September 12, 2003 with respect to the rejections made over Xu et al., alone or in view of Goelzer, have been fully considered but they are not persuasive.

Beginning on page 11 (item 8), applicant argues,

“According to the Xu reference, ‘the preheated feedstock is contacted with hot regenerated catalyst in the lower part of a reactor [first reaction zone b] with the results that catalytic cracking reaction takes place, and the mixtures of vapors and the coke deposited catalyst are up-flowed and enter into a suitable reaction environment with the results that **isomerization** and hydrogen transfer take place.’ ” (paragraph 2).

“In marked contrast, the second riser cracking section (4) of the present claims is a **catalytic cracking** section for selectively cracking the gasoline produced in the first riser cracking section (2) to olefins as product. In addition, because the function of the second riser section is cracking, higher temperatures than those necessary for isomerization are required.” (paragraph 3).

The examiner respectfully disagrees and maintains that the apparatus of Xu et al. meets the claims, since a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Also, the specific “temperature” of the reaction is not considered an element of the apparatus, but a process limitation.

Applicant additionally argues,

“The stated purpose of the Xu reference is the production of isobutene and isoparaffin-enriched gasoline. The objectives of the present claimed invention is to provide an apparatus for the selective production of olefins such as ethylene, propylene, the butenes and the pentanes...” (paragraph 4).

Again, a recitation of the intended use or purpose of the claimed invention must result in a

structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art.

Applicant additionally argues,

“The Xu reference also differs from the present invention in that the structure of the outlet zone (d) is similar to that of a conventional iso-diameter riser [0026] and, of course, is a conduit for isobutene and isoparaffin-enriched gasoline. In contrast, the riser product conduit of the present invention need not be so constructed and, of course, is a conduit for olefins such as ethylene, propylene, the butenes and the pentanes.”

The examiner respectfully disagrees and maintains that Xu et al. meets the claims. The specific products that flow through the outlet conduit (i.e., ethylene versus the disclosed isobutene, etc.) do not patentably distinguish over the apparatus of Xu et al., since the specific material worked on by an apparatus is considered a process limitation, which holds no patentable weight in apparatus claims. In response to applicant's argument that the reference fails to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the specific structural features that distinguish riser product conduit **26** from outlet zone **d** of Xu) are not recited in the rejected claims. Although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In any event, a comparison of FIG. 1 of Xu with FIG. 1 of Applicant shows the two structures being substantially identical, and it is therefore unclear as to how outlet zone **d** structurally differs from applicant's riser product conduit **26**.

Regarding the combination of the Xu et al. reference with the Goelzer reference, applicant argues (beginning on page 14, under item 10),

“... the Goelzer reference does not cure the deficiencies of the Xu reference. Further, there is no objective teaching in the references that would support combining the references.” (paragraph 2).



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In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the teaching, suggestion, or motivation can be found, for example, in section [0025] of Xu et al., which states,

“The method of controlling the second reaction temperature is to inject quenching mediums at the conjunct section between the first reaction zone and the second reaction zone and/or to install a heat remover in the zone.”

Goelzer similarly discloses this concept of riser reactor temperature control. For example, Goelzer (column 8, lines 27-40) teaches,

“... the atomizing quench injection of light volatile liquid hydrocarbons can thus be employed to conduct riser reactor profiling for desired product production... by maintaining desired lower riser reactor outlet temperatures while maintaining conditions in the fresh feed injection and mix zone at sufficiently high temperatures.”

Given that both references teach the inventive concept of temperature control via injection of quenching mediums into a riser reactor (i.e., for maintaining suitable reaction temperatures for producing a desired product within a given zone of the riser), the examiner maintains that one having ordinary skill in the art at the time the invention was made would have had proper motivation for combining the teachings of Goelzer with Xu et al.

6. Applicant's arguments filed on September 12, 2003, with respect to the rejections made over the Weinberg et al. reference have been fully considered and are persuasive, and therefore said rejections have been withdrawn.

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***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

\* \* \*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951\*\*. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

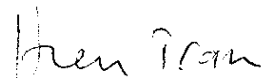
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

*\*\* As of December 10, 2003, the telephone number will be changed to 571-272-1449.*

Jennifer A. Leung

November 17, 2003



**HIEN TRAN  
PRIMARY EXAMINER**